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ABSTRACT

In an overview of a very comprehensive and current trend in personnel training, that of a "competency-based" format, it is apparent that there exists certain and specific aspects of what perhaps constitutes a "total" program in competency-based methodology. These aspects are competency identification, competency organization, competency analysis, competency units, competency evaluation, and competency feedback. The Rocky Mountain Regional Resource Center, in cooperation with the University of Utah Department of Special Education, is field testing a competency-based training program designed to maximize the effectiveness of classroom teacher skills in providing remedial services to handicapped children. The training program is designed to prepare the "generalist" as the agent best to develop and expand these functions. Hopefully the model will show relevance not only to the special educator, but also to other personnel types. (Author)

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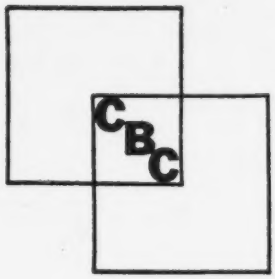

CCBC Notebook
The Competency Based Curriculum

No. 1, Vol. 3, October 1973

The Notebook begins its third year with an expanded mission and a greatly expanded family of readers and colleagues in the developmental work entailed in competency based programs. The editorial describes some indications of this expansion and its effects.

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The Editorial Board has been enlarged, and all readers are encouraged to contact the editors or the nearest member of the Editorial Board with 1) reports of research and development work--especially if you have developed instructional materials and have data concerning its use, 2) notes of interest, or 3) annotated references that have not appeared in the annual listing (Winter issues) of the Notebook.

This issue contains a brief editorial, a report by Gene Lamb on the California competency based program for certifying public school administrators, an article by Tom Valeski describing a competency based project for training supervisors in special education at the Rocky Mountain Region Resource Center, and the Notes of Interest section.

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The CCBC Notebook is a quarterly, non-profit publication that serves the Competency Based Interest Group of NCPEA. Its editors are Lloyd McCleary and Tom Brown with offices at 339 Milton Bennion Hall, University of Utah, Salt Lake City, Utah 84112. The Editorial Board members are John Brubacher, University of Connecticut; Charles Case, University of Vermont; David Erlandson, Queens College; John Greer, University of Atlanta; Gene Lamb, San Jose State University; Harold Moore, Phoenix Research Institute for Management and Education; Clarence Olsen, Chicago State University; Jerry Rasmussen, Los Angeles State University; Jack Seifert, Queens College; Samuel Silverstein, University of Atlanta; Mort Stenchever, University of Utah, School of Medicine; Ward Sybouts, University of Nebraska; Ed Van Meter, Kansas State University.

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A CONTINUUM MODEL FOR COMPETENCY BASED TRAINING

Tom Valeski - Rocky Mountain Regional Resource Center

Editors Note: The RMRRC is one of six centers funded by BEH (Bureau of Education for the Handicapped) to facilitate programs for handicapped children. Using some of the concepts developed by members of the NCPEA Interest Group and espoused by the Notebook, the RMRRC is pursuing competency training as described in this article by Tom Valeski.

In an overview of a very comprehensive and current trend in personnel training, that of a "competency based" format, it is apparent that there exist certain and specific aspects of what perhaps constitutes a "total" program in competency based methodology. A descriptive summary may identify the foregoing components as those essential aspects:

I. Competency Identification
II. Competency Organization
III. Competency Analysis
IV. Competency Units
V. Competency Evaluation
VI. Competency Feedback

The Rocky Mountain Regional Resource Center (RMRRC) in cooperation with the University of Utah Department of Special Education, is field testing a competency based training program, designed to maximize the effectiveness of classroom teacher skills in providing remedial services to handicapped children. The training program provided by RMRRC is designed to prepare the "generalist" as the agent to best develop and expand these functions.

Although the following discussion articulates the special educator as its subject, hopefully the model shall show relevance to expansion of other personnel types.

I. COMPETENCY IDENTIFICATION

This is a subfactor descriptive of the existence and credibility of the assumed competencies within a given professional area.

Retrieval of these may follow 1) the deductive hypotheses that literature descriptions, certification and licensing requirements, and graduate-level course contents reflect the "ideal" skills and proficiencies, or that 2) a field-based evaluation, or needs-assessment method shall provide the potential competencies for consideration in the developmental model.

In the preparation phases of competency-identification, for example, extensive questionnaires for key staff or immediate environmental personnel who are aware of expected, or known, competencies of associated personnel may be used. Dr. Lloyd McCleary, University of Utah, Department of Educational Administration, presents a structured approach to the competency identification phase in preparation for competency based training, (McCleary, 1973). His approach to competency identification centers about a "QAM" or a Quadrant Assessment Model.

"The project presented herein was performed pursuant to a grant from the U.S. Office of Education, Department of Health, Education, and Welfare. The positions expressed herein, however, do not necessarily reflect the position or policy of the U. S. Office of Education, and no official endorsement by the U.S. Office of Education should be inferred."

Innately, the quadrant assessment allows for descriptions based upon discrepancies seen in ideal and/or real evaluations of a given competency. Consider a hypothetical competency for example; "Principals shall be able to write teaching-lesson plans." If this particular competency, according to the index of consensus, were ideally rated high, as an essential, and a necessarily high-proficiency level competency, it would exist at the top of the scale under the ideal rating column. If we cross-referred this "ideal" rating of the competency to the real column, and, in fact, found its agreement to exist, in that the "high-ideal" rating of this particular competency were at a level of "high-real" practice, we may have developed an important critical training component for a pre-service content area. At this point, we can be relatively confident, that in terms of importance, (ideally) "writing lesson plans" is an essential competency for principals; and, in practice, his level of proficiency and frequency of practice is, as well, high.

Other cross-references may be performed, for example, with similar "high ideal" competencies. These, again, ought to exist at a high level of practice and proficiency. A cross-referral to the competency statement, ("Principals shall be able to understand a student's learning needs.") may indicate a low "real" rating. This type of discrepancy, although not ideal for training at a pre-service level, may have implications for an inservice training component assuming that the competency, again, ought to be practiced at a high level; but in fact, is practiced at a low-real level, currently.

II. COMPETENCY ORGANIZATION

We can assume that competencies have been identified, and that the survey has produced a repertoire of expected or characteristic skills of a given profession. It is, at this point, essential that these competencies be structured into teachable, trainable and measurable structures. Assumedly, in every given competency statement, there exist two measures, or factors, which require separation for the purpose of development of organization and structure, by which that competency shall be trained.

The first of these measures is termed a process factor. By this, we may clarify the particular capability or talent subsumed in the competency statement, regardless of the context in which that statement occurs. In the case of a teacher, for example, in competency statement (1) is the process factor underlying the statement that of observation, interpretation, adaptation, organization, etc.?

Also characteristic of each competency statement is the "area of responsibility," or a content factor. A designation of the specific content inherent in statement (1) is the second necessary determination. Is it described as media, instruction, public relations, diagnosis, support system, etc? Certain problems involved in research in identifying described competencies, characteristic of special education resource personnel, were that the range of terminology regarding process as well as that of content, in many cases, were overlapping, non-descriptive and lacked specificity for purposes of training. There is difficulty, at best, in attempting to describe what competency would need to be trained for these special education personnel.

FIGURE 1

COMPETENCY STATEMENT (1):

"The teacher shall be able to maintain a suitable learning environment for her students."

PROCESS FACTOR:

Observation? Interpretation?
Adaptation? Organization?

CONTENT FACTOR:

Media? Instruction?
Public Relations?
Diagnosis?
Support System?

A basic attempt to define and alleviate this type of discrepancy is approached by Dr. Rubin Altman in his cooperative effort with Edward Meyen, University of Missouri, Columbia, (Meyen and Altman, 1973). It is their contention that each competency statement would exist, in what termed, a function-context paradigm. In other words, in consideration of the aforementioned two aspects of each competency statement, (process and content), a two-way grid or graph is necessarily constructed, so that categorization or classification of each competency statement in terms of (1) its function or inherent skill and (2) its context, or content area of responsibility.

It is first necessary that those evaluating the competency statements refer to the vertical side of the grid and attempt to define its actual function. Given the competency statement in the previous discussion, for example, ("Principals shall be able to write teaching-lesson plans."), the function described in this particular competency statement may be that of organization. Referring to the horizontal scale, the context or content described in this particular competency statement may be that of materials. In Figure 2, the competency statement, (1) is placed under function cell, "organization" and (2) under the context area of "materials." Our itemization of the competency statement in the original form, at this point, is more clearly teachable in that we have separated the function from the context.

FIGURE 2

A function-context graph representing sub-areas of function and context, and an appropriate placement of Competency Statement, "Principals shall be able to write teaching lesson plans."

FUNCTION	CONTEXT: MATERIALS	CONTEXT: INSTRUCTION	CONTEXT: PUBLIC RELATIONS
Interpretation			
Observation			
Organization			

It is also apparent by reference to Figure 2, however, that the listing for function areas does not exist in a sequence or developmental continuum, the latter contingent upon prior success with the former. (i.e., the ability to "observe" is debatable as to its developmental relationship to the ability to organize.") Similarly, the horizontal context scale does not exist as development or hierarchy by which prior knowledge in the foregoing content area may proactively transfer abilities and skills in the preceding area. (i.e., familiarity with"materials" is not essentially prerequisite to familiarity with "public relations.")

With due consideration to the described inconsistency, the "continuum" model attempts to restructure each of the aspects of the function-context paradigm. In the vertical column, in this case, process areas were employed from the cognitive domain of Bloom's Taxonomy of Educational Objectives, (Bloom, 1964) and were plotted on the grid, insofar as they do represent a hierarchy, or general process sequence of skills. The reader will observe that in this function-context paradigm, there does exist the described developmental sequence, or continuum of function skills, (Process factors), as well as the continuum for the context area, (content area), in a general sequence.

FIGURE 3

CONTENT

PROCESS		IDENTIFY	DIAGNOSE	PRESCRIBE	PROGRAM	EVALUATE
1	KNOWLEDGE (recall					
2	COMPREHENSION (understanding)					
3	APPLICATION (use)					
4	ANALYSIS (clarify)					
5	SYNTHESIS (regestalt)					
6	EVALUATION (judgment)					

Function skills abstracted from Bloom's Taxonomy range in the foregoing sequence: (1) Knowledge - a process of cognition, or general awareness, in attainment of the next function level or (2) comprehension describes a process by which knowledge is cognized, received and put into storage for further recall. The function continuum continues through application, (4) analysis, (5) synthesis, and (6) evaluation. At each function level, (1-6), facility in the preceeding process is essential for development in the higher levels. Designated content areas were basic categorizations adopted from Public Law 96, Bureau

of Education for the Handicapped, as service mandate for Rocky Mountain Regional Resource Center. These content areas, again, exist on a continuum, by which development in preceding content areas are clearly generalized to development in further content areas. These range through (1) identification, (2) diagnosis, (3) prescription, (4) programming, and (5) evaluation, and describe the content referral-sequence useful for resource personnel.

FIGURE 4

CONTENT

PROCESS	IDENTIFY	DIAGNOSE	PRESCRIBE	PROGRAM	EVALUATE
KNOWLEDGE (recall)					
COMPREHENSION (understanding)		4			
APPLICATION (use)	3			2	
ANALYSIS (clarify)					
SYNTHESIS (regestalt)		1			
EVALUATION (judgment)					

CONTENT

(1) The generalist shall formulate a diagnostic statement from a single test.
(2) The generalist shall demonstrate the use of instructional methods.
(3) The generalist shall utilize a conventional task analysis for basic subject areas.
(4) The generalist shall demonstrate an understanding of formal test batteries.

Let us now examine competency statement (1), in terms of its analysis and placement on the grid (Figure 3). The first competency statement is "the generalist shall formulate a diagnostic statement from a single test." If we examine this particular competency statement in terms of its process area, we are left with the term "formulate" or "formulation." A description of this term implies the ability to put together, to coordinate parts of the total sum into a single statement, a term most related to that of synthesis, or the fifth level, vertically, on the process scale. In terms of function or process area, then competency stated (1) is graphed in the "synthesis" process cell.

Examinations of competency statement (1) in terms of content, yields a content description involving "diagnostic" or "diagnostic statement." This content description relates most closely to that of diagnosis in the horizontal content scale. Plotting of the statement in terms of content, therefore, would place,

in the content column, competency statement (1) into the "diagnosis" content area. We have, at this point, placed a total competency statement into a function-context paradigm, the scales of which occur in a given sequence or continuum of development.

Competency statement (2) is read as, "the generalist shall demonstrate the use of instructional methods." Examination of this statement in terms of process or function gives information in terms of "demonstration," "use" or "application." This terminology relates most closely with that area on our function or process grid as "application." We may therefore plot statement (2) in the application level of process. Examination for content in competency statement (2) gives us information regarding "instructional methods," allowing for description of materials or media, suitable as an appropriate parallel with "programming," under the content scale. Again we may plot our competency statement in terms of content under the"programming" content column area appropriately. We, again, classify the total competency statement in terms of function and context, process and content.

The third competency statement is "the generalist shall utilize a conventional task analysis for basic subject areas." Examination of this competency statement in terms of process or function yields information regarding "utilization." We may designate "utilization" as again, "use" or "execution." We may therefore plot this competency statement (3) in the function process area under "application." Task analysis of subject area implies identification of basic sub-skills underlying more general skills in academic areas, and may be graphed in the "identification" content area.

III. COMPETENCY ANALYSIS

Given the broad content area of "diagnosis" or the process area of "application," it is further necessary to reduce these areas into specific "training components," or to analyze the function-context description into more specific elements, by which behavioral objectives regarding those elements, may be written, trained, practiced, and evaluated.

Let us consider the following additional competency statement (4). Figure 4; "the generalist shall demonstrate an understanding of formal test batteries." The initial task is to organize the competency statement according to its process-content locus. Examination of this statement allows for a "comprehension"-"diagnosis" match.

In the competency analysis phase, "formal test batteries" may require further breakdown into specific content areas. The following brief outline may structure formal test batteries into more specific areas:

A. The Nature of Intelligence:

Before one, unexposed or unfamiliar to actual standard formal test instruments and collections of instruments, termed "batteries" may be trained in the use of them, perhaps exposure to the Nature of Intelligence, the basis, or theory, by which formal test instruments may be constructed, is essential. Theoretical constructs, for example, as described in the "total" or "G-concept" of Thurstone, allows a theoretical base for a test which yields a general total score.

1. a split factor test, may segregate the total idea of intelligence into a (1) verbal area and (2) a performance area by which submeasures of each of these are classified into a two-score comparison.

2. a multi-factor test, explores more than two areas, or several aspects of intelligence.

B. Measurement

The Nature of Intelligence may give more specific background to that of actual "measurement," or types of measurement.

1. Intelligence measurement. Standard or specific measures of intelligence, including the California Test of Mental Maturity (CTMM) or the Slosson Intelligence Test (SIT) are formal test measurements describing intelligence, or IQ.

2. Achievement measurement. The Metropolitan Achievement Test (MAT) and the Standard Diagnostic Reading Test (SDRT), the California Achievement Test (CAT) and the Standard Diagnostic Test of Arithmetic (SDAT) allows for standard test measurement of achievement in academic subject areas.

3. Process measurement. When we consider specific learning processes, theories, or constructs, process measures of ability may follow; Illinois Test of Psycholinguistic Ability (ITPA) or Detroit Test of Learning Aptitude (DTLA).

The preceding competency statement, to this point, bears sufficient descriptors (identification, process-content locus, content analysis) to insure a "performance-based" approach to its development, for the learner. The expected learner "performance" shall, in this case, be that of "application" of the described components in the "Competency-Analysis" phase.

IV. COMPETENCY UNITS

Specific items of information within the content of the given competency statement are generally structured as self-contained learning packages. Literature reviews describe these packages as "learning modules," "units," "training packages," etc. Each label, however, commonly represents a trainable, integrated procedure, able to be evaluated. In accordance with the "continuum" model proposed, a single "unit" of competency instruction would necessarily allow for adherence to a selected format:

1. A statement of the competency to be trained.
2. Pre-designated process and content factors.
3. Component analysis of the content within the competency statement.
4. Instructional media and method to represent those components
AND
5. Expected performance "outcomes" or "products" of the learner.

As determined by the "continuum" process level of learner development, (i.e. Comprehension, Application, Synthesis, etc.) the instructional procedures within the "unit" shall vary:

1) "Comprehensive" abilities may demonstrate themselves as "outcomes" or

"products," in general recall or familiarity with information. Sufficient procedure for this may include a lab setting, readings, learning-group discussions.

2) "Application" skills are manifest as "outcomes" or "products" in demonstrable use of information. Minimal procedure within the "unit" will require field-base setting, practice, participation with classroom teacher or child, "practicum" experience.

This framework establishes a baseline for procedures necessary to evaluation, in that the predicted "outcomes" or learner "products" are written as operational "performance" objectives, or measurable terminal behaviors of the competency "units."

V. EVALUATION

Procedures in evaluation appear to be an often overlooked and/or misdirected aspect in competency based training procedures. In the former, it is commonly assumed that mere participation in the "performance-objective" of the competency "unit" insures the competency itself. Without given success criteria, (i.e., ratings, percentages of accuracy, attitudinal changes, etc.) and the empirical measurement or observation of these criteria, it is unlikely that one can be sure that change has been made.

The latter oversight typically misguides evaluation, in that highly uncorrelated evaluation criteria are intended to appraise the stated competency. A multiple-choice examination in the characteristics of test instruments is debatable as to its evaluative ability in discriminating among the talents of trainees who "shall administer a formal test instrument."

In the "continuum" model the "level of Proficiency" (i.e. Synthesis, Application, etc.) is evaluated as an immediate learner function, in a restatement of its own definition. Thus, "performance objectives," within the "competency units," for the "application" process, are discrete measures of the learners ability, after training, to "apply" whatever the content "component" within the competency is.

VI. FEEDBACK

Later procedures in revision or restructuring of the developed competency based program, may involve that of Phase 6, Feedback, by which known effects, transferabilities, or the actual efficacy of the competency statement itself, is appraised in a lab, or field-base setting by the trainer. Comparative information essential to the trainer to evaluate the effects of training and the efficacy of the programmed competencies, is reprocessed later for needed restructuring.

The foregoing overview of our developmental efforts, in producing the generalist-training program, hopefully,shall be useful to the reader as reference for procedural considerations in competency based methodology. Further developments in the success and/or ineffectiveness of the described procedures shall be reported at a later date.